



# Florida Power

CORPORATION  
Crystal River Unit 3  
Docket No. 50-302  
Operating License No. DPR-72

September 22, 1998  
3F0998-02

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D.C. 20555-0001

Subject: Licensee Event Report (LER) 50-302/98-009-00

Dear Sir:

Please find enclosed Licensee Event Report (LER) 50-302/98-009-00 which discusses a personnel error during troubleshooting activities on the Emergency Feedwater Initiation and Control (EFIC) System that caused a Main Steam Line Isolation (MSLI) and resulted in a manual reactor trip. This report is being submitted pursuant to 10CFR50.73(a)(2)(iv).

If you have any questions regarding this submittal, please contact Mr. Walter J. Pike, Manager, Nuclear Regulatory Compliance, at (352) 563-4988.

Sincerely,

C. G. Pardee  
Director  
Nuclear Plant Operations

CGP:dwh  
Enclosure

xc: Regional Administrator, Region II  
Senior Resident Inspector  
NRR Project Manager

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## LICENSEE EVENT REPORT (LER)

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FACILITY NAME (1)

CRYSTAL RIVER UNIT 3

DOCKET NUMBER (2)

05000302

PAGE (3)

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TITLE (4)

Personnel Error During Troubleshooting Causes A Main Steam Line Isolation And Manual Reactor Trip

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
08	27	98	98	-- 009	-- 00	09	22	98	FACILITY NAME	DOCKET NUMBER
OPERATING MODE (9)		1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)							
POWER LEVEL (10)		100	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)	
			20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)	
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71	
			20.2203(a)(2)(ii)		20.2203(a)(4)		X 50.73(a)(2)(iv)		OTHER	
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A	
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)			

## LICENSEE CONTACT FOR THIS LER (12)

NAME

Dennis W. Herrin, Principal Nuclear Licensing Engineer

TELEPHONE NUMBER (Include Area Code)

(352) 795-6486

## COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

## SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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## ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

At 2348, on August 27, 1998, Florida Power Corporation's (FPC) Crystal River Unit 3 (CR-3) was in MODE 1 (POWER OPERATION) at 100 percent RATED THERMAL POWER. While troubleshooting a half trip signal on Emergency Feedwater Initiation and Control (EFIC) System Channel A Main Steam Line Isolation (MSLI), both Main Steam Isolation Valves (MSIVs) from the "A" Once Through Steam Generator (OTSG) closed. The reactor operator initiated a manual reactor trip upon closure of the two MSIVs. The reactor protection system performed as expected and reactor operators responded properly per Emergency Operating Procedures (EOPs). The cause for the MSIVs closing was personnel error during the EFIC troubleshooting activity. The cause for the manual reactor trip has been reviewed with Maintenance Department personnel and Operations Department Nuclear Shift Managers. Since 1990, FPC has submitted three Licensee Event Reports involving plant equipment troubleshooting activities that resulted in a reactor trip.

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## LICENSEE EVENT REPORT (LER)

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

**EVENT DESCRIPTION**

At 2348, on August 27, 1998, Florida Power Corporation's (FPC) Crystal River Unit 3 (CR-3) was in MODE 1 (POWER OPERATION) at 100 percent RATED THERMAL POWER. FPC was troubleshooting a half trip signal on the Emergency Feedwater Initiation and Control (EFIC) System Channel "A" Main Steam Line Isolation (MSLI), [JE, ANN] when both Main Steam Isolation Valves (MSIVs) (MSV-411 and MSV-412) [SB, ISV] from the "A" Once Through Steam Generator (OTSG) [SB, SG] closed. As required by Administrative Instruction AI-505, "Conduct of Operations During Abnormal and Emergency Events," the reactor operators initiated a manual reactor trip upon closure of the two MSIVs.

The EFIC System performs the following functions in conjunction with the actuation of Emergency Feedwater (EFW) [BA]:

1. Controls the rate of OTSG level increase to minimize overcooling of the reactor coolant system (RCS) [AB] .
2. Limits EFW flow to prevent exceeding maximum flow limits and EFW pump runout.
3. Isolation of the main steam lines and main feedwater lines of a depressurized OTSG.
4. Selects the appropriate OTSG(s) to supply EFW to in the event of a steam/feedwater line rupture.
5. Terminates EFW to a OTSG that approaches an overfill condition.
6. Controls the atmospheric dump valves to maintain steam pressure at a predetermined set point.

Each EFW actuation logic train actuates on a one-out-of-two taken twice combination of trip signals from the instrumentation channels. Each EFIC channel can issue an initiate command, but an EFIC actuation will take place only if two channels issue initiate commands. The one-out-of-two taken twice logic combinations are transposed between trains so that the failure of two channels prevents actuation of, at most, one train of EFW. For this event, the one-out-of-two taken twice combination was satisfied by the initial failure of the U-20 optical isolator and the inadvertent removal of the signal from the U-44 optical isolator receiver during EFIC troubleshooting activities.

This event is reportable in accordance with 10CFR50.72(b)(2)(ii) and 10CFR50.73(a)(2)(iv) as a condition that resulted in a manual or automatic actuation of any engineered safety feature (ESF), including the reactor protection system (RPS). At 0304, on August 28, 1998, FPC made a four hour notification to the NRC Operations Center required by 10CFR50.72(b)(2)(ii), Event Number 34705.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

**EVENT EVALUATION**

The MSIVs closed as required when the second channel of EFIC tripped. Reactor operators manually tripped the reactor as required by AI-505. The reactor protection system (RPS) performed as expected to shut down the reactor. Reactor operators properly executed the Emergency Operating Procedures (EOPs) for plant shutdown. Plant systems operated as expected during the reactor trip, with the following exceptions:

Main Steam Safety Valve (MSSV) MSV-34 [SB, RV] did not fully reseal after the trip. Atmospheric dump valve MSV-25 [SB, RV] was momentarily cycled to lower the "A" OTSG pressure and allow the valve to reseal.

Condenser [SD, COND] vacuum degraded upon loss of Gland Steam [SH] pressure. Gland Steam supply was aligned from the "A" OTSG and was lost due to isolation of the "A" OTSG. The "B" OTSG Gland Steam supply through MSV-57 could not be restored by electrically opening the valve from either the main control board or the supply breaker. MSV-57 was opened manually and condenser vacuum was restored. (Valve troubleshooting and repair were not required for plant restart.)

In conclusion, this event did not impact the public health and safety.

**CAUSE**

The cause for MSIVs closing was personnel error. Use of the maintenance bypass circuit for the EFIC System during troubleshooting activities was not well understood. Maintenance personnel were troubleshooting a half trip signal on EFIC Channel "A" MSLI in accordance with Maintenance Procedure MP-531, "Troubleshooting Plant Equipment."

Isolation cable U-20 did not appear to have light. When isolation cable U-44 was lifted to reset Trip Bus 2, the two MSIVs to the "A" OTSG closed. Maintenance personnel did not recognize that isolation cable U-44 was associated with Trip Bus 1 and that the output breaker for Trip Bus 1 should have been opened prior to lifting isolation cable U-44. When isolation cable U-44 was lifted, the one-out-of-two taken twice logic was completed for a Channel "A" MSLI signal.

**IMMEDIATE CORRECTIVE ACTIONS**

The plant was stabilized in MODE 3 (HOT STANDBY).

**ADDITIONAL CORRECTIVE ACTIONS**

The preliminary root cause evaluation for the manual reactor trip was reviewed with the Maintenance Department Supervisor and Technicians involved with the MP-531 EFIC troubleshooting activity.

**LICENSEE EVENT REPORT (LER)****TEXT CONTINUATION**

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**TEXT** (If more space is required, use additional copies of NRC Form 366A) (17)

The failed optical isolation cable (U20) was replaced prior to plant startup.

An Interoffice Correspondence (IOC) was issued on August 28, 1998, stating that prior to obtaining Operations approval to start work, MP-531 troubleshooting plans will require a second party review by an individual knowledgeable of the tasks to be performed and independent of the troubleshooting plan development. This IOC and the preliminary root cause evaluation for the manual reactor trip were either discussed with or provided to Maintenance Department personnel.

Apparent causes for the manual reactor trip and lesson learned from that event have been provided to the Operations Department Nuclear Shift Managers.

Engineering evaluated the performance of the MSSVs following the manual reactor trip. The engineering evaluation concluded that the MSSVs, including MSV-34, operated satisfactorily and that no corrective action or maintenance is required.

**ACTIONS TO PREVENT RECURRENCE**

The EFIC Training Module will be revised to include a discussion on the use of Performance Testing procedure PT-146, "EFIC Optical Isolator Replacement," for EFIC troubleshooting and a special training session will be conducted on the use of PT-146 by October 30, 1998.

An assessment of the MP-531 process will be performed by October 30, 1998. The assessment will include, but not be limited to, risk assessments, independent review of troubleshooting plans, and troubleshooting plan development.

**PREVIOUS SIMILAR EVENTS**

Since 1990, FPC has submitted three (3) Licensee Event Reports (LERs) involving plant equipment troubleshooting activities that resulted in a reactor trip.

LER 50-302/91-001-00:      Relay Design Combined with Maintenance Trouble Shooting Leads to De-energized ES Busses, Reactor Trip, and Emergency Diesel Generator Start.

LER 50-302/91-017-00:      Reactor Trip Caused by Feedwater Reduction Due to Nuclear Power Instrumentation Channel Being Selected for Control Which Contained a Failed Detector.

LER 50-302/92-001-00:      Relay Design Combined with Maintenance Trouble Shooting Leads to De-energized ES Busses, Reactor Trip, and Emergency Diesel Generator Start.

**LICENSEE EVENT REPORT (LER)**

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**ATTACHMENTS**

Attachment 1 - Abbreviations, Definitions, and Acronyms

Attachment 2 - List of Commitments

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ATTACHMENT 1  
ABBREVIATIONS, DEFINITIONS AND ACRONYMS

AI	Administrative Instruction
CFR	Code of Federal Regulations
CR-3	Crystal River Unit 3
EFIC	Emergency Feedwater Initiation and Control System
EFW	Emergency Feedwater System
EOP	Emergency Operating Procedure
ESF	Engineered Safety Feature
FPC	Florida Power Corporation
FWP	Feedwater Pump
IOC	Interoffice Correspondence
LER	Licensee Event Report
MP	Maintenance Procedure
MSIV	Main Steam Isolation Valve
MSLI	Main Steam Line Isolation
MSSV	Main Steam Safety Valve
OTSG	Once Through Steam Generator
RCS	Reactor Coolant System
RPS	Reactor Protection System

**NOTE:** Improved Technical Specifications defined terms appear capitalized in LER text. Defined terms/acronyms/abbreviations appear in parenthesis when first used. EIS codes appear in square brackets.

## LICENSEE EVENT REPORT (LER)

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ATTACHMENT 2  
LIST OF COMMITMENTS

RESPONSE SECTION	COMMITMENT	DUE DATE
Actions to Prevent Recurrence	The EFIC Training Module will be revised to include a discussion on the use of Performance Testing procedure PT-146, "EFIC Optical Isolator Replacement," for EFIC troubleshooting and a special training session will be conducted on the use of PT-146 by October 30, 1998.	October 30, 1998
Actions to Prevent Recurrence	An assessment of the MP-531 process will be performed by October 30, 1998. The assessment will include, but not be limited to, risk assessments, independent review of troubleshooting plans, and troubleshooting plan development.	October 30, 1998



# CATEGORY 1

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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AUTH.NAME AUTHOR AFFILIATION  
PARDEE,C.G. Florida Power Corp.  
RECIP.NAME RECIPIENT AFFILIATION  
Records Management Branch (Document Control Desk)

SUBJECT: Forwards LER 98-009-00, which discusses personnel error during troubleshooting activities on EFIC.Rept is being submitted IAW 10CFR50.73(a)(2)(iv).

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 1+7  
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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